

# The Use of Web Technologies for Practice Based Learning Model in Vocational Education: A Literature Review

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# The Use of Web Technologies for Practice Based Learning Model in Vocational Education: A Literature Review

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**Abstract.** Practice-based learning model is about to making the learning environment as realistic as possible and requires students to demonstrate what they know to link theory and practice. The nature of web technologies such as user centered, flexibility, mobility and multimedia capability are the key features that make web technology as a potential match for practice based learning. Our objectives were to identify the use of web technologies for practice based learning model in vocational education and to summarize strengths and limitations identified in the literature. The research methodology for this study was to review published studies and research on practice-based learning and web technologies in vocational education, the range of which included literature reviews and empirical research. We searched for the term “web technologies” in combination with “practice based learning” and “vocational education” in various literatures databases, and looked for additional studies by key authors. Searches finds that web technologies has been widely used for practice based learning model in vocational education in developed country in America, Europe, and Australia. This comprehensive literature review concludes with some of the advantages, drawbacks, and best practice of web technologies for practice-based learning model.

## 1. Introduction

This article explores the use of web technologies for practice based learning model in vocational education. Practice-based learning model is about making the learning environment as realistic as possible and requires students to demonstrate what they know to linking theory and practice [1]. It combines the current and innovative educational curriculum of the school’s academic degree programs with real world experiences [2]. It is explicitly designed to relate to professional practice standards [3]. Many vocational education institution have been adopted it as part of their curriculum. But the requirement of practice-based learning to linking theory and practice is not easy to implement. The institution should put time, cost, personal, and many other things into consideration.

Web technologies may help vocational education institution to address the issue. The nature of web technologies such as user-centered, flexibility, mobility and multimedia capability are the key features that make web technology as a potential match for practice based learning. Although web technologies has been used widely used in many education and work field, It requires enhanced skills to engage



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22 learners in meaningful interaction and to overcome the transactional distance of online learning[4]. This comprehensive literature review concludes with some of the advantages, drawbacks, and best practice of web technologies for practice-based learning model.

## 2. Methods

The research methodology for this study was to review published studies and research on practice-based learning and web technologies in vocational education, the range of which included literature reviews and empirical research. We searched for the term “web technologies” in combination with “practice based learning” and “vocational education” in various literatures databases, and looked for additional studies by key authors. 10

The primary literature sources were journal articles and full texts. The major sources we used for data collection were online databases including ERIC, EBSCO, PsycINFO, ContentFirst, Google Scholar, SAGE Online, Project Muse, Education Full Text, and Academic Search Premier.

## 3. Results and Discussion

### 3.1. The essential principle of practice-based learning

There is no single universally agreed definition of practice-based learning; it is interconnected with and interdependent on other professional activities such as service 25 development and regulation, as well as educational activities such as assessment and accreditation. In order to understand the practice-based learning, it is important to know its essential principles[5]. The essential principles of practice-based-learning are adaptive curriculum, workplace experience, and stakeholder collaboration.

#### 3.1.1. Adaptive Curriculum

In order to overcome skills mismatch, the curriculum of practice-based learning must be adapted to the needs of workplace. This principle has been indirectly used in many countries such as Australia, Ireland, Finland, etc [6]. It is clear that the need of workplace keep changing overtime and the curriculum need to adapt to that situation.

Australia has been moving from a strategic planning model to a student demand driven system where Each state and territory has adapted different skills forecasting methods to meet local needs. National forecasts by industry were converted into regional forecasts, broken down into the 341 occupational unit groups of the Australian Standard Classification of Occupations. These were then used to determine the employment outlook for workers by age, sex, qualifications and hours worked per week.

Ireland 15 use two mechanisms to anticipating skills needs. First, The ‘Expert Group on Future Skills Needs’ includes representatives of social partners, government departments, industrial development organizations and education and training bodies. Its objectives include identifying skills needs, developing techniques that will assist skills forecasts and advising on decisions related to training policies. It produces long-term forecasts, as well as projections of future demand by occupational groups under different growth. Two, The ‘FÁS/ESRI Manpower Forecasting Programme’ aims to provide information on the changing pattern of occupations and to identify skills needs in broad occupational fields.

Finland Anticipating Educational Needs by using labour force projections, it aims to forecast demand for new recruits by occupational groups and the supply of new job-seekers. Based on these forecasts, the anticipated educational need is determined by occupational field and level of education.

#### 3.1.2. Workplace Experience

3 The employees valued work experience as the main source of their competence. They also developed their competence mainly through learning at work which highlight the importance accorded to experience in competence and in workplace learning [7]. As part of the curriculum, students often take part in work experience or work placement. Students benefit from the partnerships established between industry, enterprises, unions and schools that better prepare them for the world of work[8].

8 Students are placed with employers primarily to observe and learn – not to undertake activities which require extensive training or experience. Students need to participate in a variety of workplace learning activities while they are still at school to assist in their development of a realistic understanding of the world of work. These activities are an integral part of their learning and career development and help students to: develop employability skills; explore possible career options; understand employer expectations; and increase their self-understanding, maturity, independence and self-confidence[9].

### 3.1.3. Stakeholder collaboration

Successful practice demands the involvement of all stakeholders from vocational education field. Because Practice-based learning is interconnected with and interdependent on other professional activities such as service development and regulation, as well as educational activities such as assessment and accreditation. Partnerships involving all stakeholders and services should be established, formalized and co-ordinated. This includes establishing co-operation structures with local companies for practical training and/or jobs after graduation. Stakeholders are committed to quality assurance and improvement strategies.

### 3.2. Indicator of practice-based learning

Practice-based learning has several indicator [10], including but not limited to:

- Students are learning in the workplace in either paid or unpaid positions.
- Students are learning through participation in industry-based tasks and/or projects as part of the curriculum.
- Students are learning about skills for career management as part of their curriculum.
- Students are learning through activities in class time that emulate activities undertaken by a professional (e.g. laboratories have appropriate standards of dress, safety procedures, standard operating procedures, quality control).
- Students are learning skills in using software tools that are identical to that used by practicing professionals.
- Students are learning through simulations of workplace environments as part of their curriculum.
- Students are assessed and given feedback on Graduate Qualities indicators that have been mapped on to professional competencies.
- Academic staff teaching in the course is practicing professionals with opportunities to share their experiences during classes students are able to connect with their professional body - and their ethics; code of conduct - as part of curriculum activities.

### 3.3. Web technologies for practice-based learning

The higher education is in the process of moving from face-to-face courses using objectivist, teacher-centered pedagogy and offered by tens of thousands of local, regional, and national universities; to online and hybrid courses using digital technologies to support constructivist, collaborative, student-centered pedagogy, offered by a few hundred “mega-universities” that operate on a global scale [11].

#### 3.3.1. Underlying technologies

Underlying these methodologies is digital support for the techniques of voting, scaling, hypertext, visualization, and the structuring of collaborative communication protocols and the structuring, filtering, and organization of collaborative discourse content. These technologies may be used in the following manner:

- Voting to direct or focus the discussion on areas of group differences and to allow for dynamic (ongoing) changes in evaluation of contributed material;
- Scaling to promote collective understanding of the group’s views, degrees of agreement, and shared meanings;

- Hypertext (the two-way linking and typing of both links and nodes) to allow the construction and expression of complex relationship structures and individual and collective cognitive maps;
- Visualization to develop the functional equivalent of the periodic table of the elements for all other fields of human endeavors;
- Communication protocol structuring to allow for equality of participation by type of communications structuring; and
- Content structuring to allow asynchronous contributions to be automatically categorized and organized and to facilitate individual problem solving within a group process.

### 3.3.2. Advantages

There are benefits to the students, the organizations, and to the society, as well as more direct cost-benefit factors. The major driving forces for digital substitution processes include:

- The value to the student is the flexibility of being able to integrate education with the demands of work and family.
- Learning effectiveness in online (ALN) or blended courses is equal to or better than in entirely face-to-face courses.
- The value to the instructor is being able to treat all students equally, and to prepare and deliver the materials of the course as a single entity.
- The value to the organization is not having to duplicate any administrative or support function as a separate entity for distance learning.
- The growing competitive environment in higher education and the need to provide quality online instruction as a matter of long-term survival.

### 3.3.3. Drawbacks

Despite the claims that web technology can improve the education quality, in the context of practice-based learning, it still has drawbacks.

- Vocational education requires special attention when offered in an online medium when compared to other fields of education [11]. This study was done in 2005 and makes a strong argument for the use of online instructional technologies to teach engineering courses with the improvements in technology.
- The absence of vital personal interactions, not only between learners and instructors, but also among colleague learners [12].
- Not all fields or discipline can employ the e-learning technique in education. For instance the purely scientific fields that include practical cannot be properly studied through e-learning. Researches have argued that e-learning is more appropriate in social science and humanities than the fields such as medical science and pharmacy, where there is the need to develop practical skills.
- E-learning may also probably be misled to piracy and plagiarism, predisposed by inadequate selection skills, as well as the ease of copy and paste.

### 3.3.4. Discussion

Despite some challenges discussed, its adoption in some institutions has increased faculty and learner's access to information and has provided a rich environment for collaboration among students which have improved academic standards [13]. By 2004 at least two million higher-education students in the U.S. were engaged in distance education utilizing various ALN technologies where whole classes can engage in a continuous discourse and group project work independent of time, place, and synchronous constraints of participation [14]. Over the past decade, the number of online courses and programs has grown tremendously [15, 16, 17]. With increased demand for online learning as well as more institutions of higher learning striving to provide diverse educational opportunities, it indicates that web technologies continues to grow as a viable means of providing increased access to a greater number of students [15, 18]. Although online learning continues to grow

rapidly, developers and deliverers of online learning need more understanding of how students perceive and react to elements of online learning along with how to apply these approaches most effectively to enhance learning [19].

#### 4. Conclusion

This literature review concludes that web technologies can be used for practice based learning with advantages and drawbacks. There are many challenges to overcome in the implementation, but the benefit of web technologies are greater than the benefits of traditional learning if it is used and applied in proper ways. Furthermore, Future research incorporating the implementation of web technologies, ideally in combination with other technologies for practice based learning model in vocational education, would be of value.

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